

rejected claims; and (d) places the application in better form for appeal, should an appeal be necessary. The Amendment was necessary and was not earlier presented because it is made in response to arguments raised in the final rejection. Entry of the Amendment is thus respectfully requested.

Applicant extends his appreciation to Examiner Tran for his courtesy in conducting the personal interview with Applicant's representative on July 16, 2002. The contents of the interview are summarized in the following remarks.

Claims 1-8 were rejected under 35 U.S.C. §112, second paragraph. The Office Action contends that the recitation "tuning the natural frequency" is vague "since applicant did not explain how the tuning method was carried out." The Office Action further contends that the "natural frequency" is unclear. As discussed during the personal interview, however, Applicant respectfully submits that the tuning method is clearly and adequately described in the present specification, and further that the specification repeatedly refers to the natural frequency of a turbine bucket. In a similar context, the claims also refer to the natural frequency of a turbine bucket. At the interview, Examiner Tran agreed that the §112 rejection will be withdrawn.

Claims 1-8 were rejected under 35 U.S.C. §102(b) or, in the alternative, under 35 U.S.C. §103(a) over U.S. Patent No. 4,605,452 to Gemma et al. This rejection is respectfully traversed.

The Office Action recognizes that any orienting of a crystal in the Gemma method is merely effected to provide a better fatigue resistance. As discussed during the interview, Gemma merely appreciates that a more durable turbine blade can result when

the crystal axis is made tangent to the blade surface in critical crack prone regions. In this manner, Gemma does not in any way appreciate that orienting a crystal seed prior to investment casting can effect a desired percentage change in the natural frequency of the turbine bucket. Rather, as noted, it is Gemma's intent merely to make the crystal axis tangent to the blade surface.

Claim 1 has been amended substantially to include the subject matter of claim 5. Additionally, claims 1 and 6 have been amended to clarify that the orientation of the crystal seed effects a desired percentage change in the turbine bucket natural frequency. At least this control of the turbine bucket natural frequency is lacking in the Gemma patent as discussed during the personal interview.

With respect to the dependent claims, Applicant submits that these claims are allowable at least by virtue of their dependency on an allowable independent claim. Reconsideration and withdrawal of the rejection are respectfully requested.

In view of the foregoing amendments and remarks, Applicant respectfully submits that the claims are patentable over the art of record and that the application is in condition for allowance. Should the Examiner believe that anything further is desirable in order to place the application in condition for allowance, the Examiner is invited to contact Applicant's undersigned attorney at the telephone number listed below.

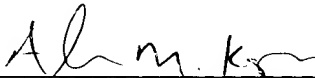
Prompt passage to issuance is earnestly solicited.

Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached page is captioned "**Version With Markings To Show Changes Made.**"

WANG  
Serial No. 09/735,503

Respectfully submitted,

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**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

**IN THE CLAIMS**

1. (Amended) A method of manufacturing a turbine bucket comprising:  
(a) investment casting the turbine bucket with a single crystal alloy; and  
(b) tuning a natural frequency of the turbine bucket without modifying physical features of the turbine bucket, wherein step (b) is practiced by, prior to step (a), placing a crystal seed along a desired direction according to an orientation between 0°-90° relative to an engine axial direction to thereby effect a desired percentage change in the natural frequency of the turbine bucket.

6. (Amended) A method of tuning turbine bucket natural frequency comprising:  
(a) placing a crystal seed along a desired orientation between 0°-90° relative to an engine axial direction; and  
(b) investment casting the turbine bucket with a single crystal alloy, wherein the desired orientation is selected to tune torsional frequencies without affecting flexure frequencies and to effect a desired percentage change in the turbine bucket natural frequency.